1 Overview

EnSight (for Engineering inSight) provides engineers and scientists with an easy-to-use graphics postprocessing package. EnSight supplies powerful, easy-to-use tools through a user-friendly interface.

The purpose of this chapter is to give you an overview of the EnSight system and its documentation. Because of the power and flexibility of EnSight, the synergy between features provides a great many visualization techniques.

The Overview topics discussed are:

Part Concepts

EnSight processing begins with your model. Usually the elements of your model are grouped into parts. *Within EnSight, nearly all information is associated with parts, and nearly all actions are applied to parts*.

Geometry

A part consists of *nodes* and *elements* (elements are sets of nodes connected in a particular geometric shape). Each node, which is shared by its adjoining elements, is defined by its coordinate-location in the model frame of reference.

Variable Values

EnSight-compatible data files provide variable values either at each part's nodes, element centers, or both. When needed (or requested) EnSight will find any variable's value at any point on or within an element by utilizing the element's shape function.

Part Attributes

Within EnSight, you can specify additional information about each part. These *part attributes* tell EnSight how to display each part and how the part responds to

EnSight controls and display options. Part attributes include:

Category	Includes attributes that control....
General Attributes	Visibility Susceptibility to Auxiliary Clipping Reference frame Response to changes in time (frozen or active) Symmetry options
Color By Attributes	Coloration (constant or by a palette associated with a variable)
Node, Element, and Line Attributes	Node visibility Node type (dot, cross, or sphere) Node size (constant or variable) Node detail (for spheres) Element-line visibility Element-line width Element-line style (solid, dotted, or dot-dash) Element representation on client (full, border, 3D border/2D full, feature angle, or not loaded) Element-size shrink-factor
Surface Attributes	Shaded Surface susceptibility Surface shading (flat, Gouraud, smooth) Fill density (for transparency) Lighting (diffuse, shininess, and highlight intensity)
Displacement Attributes	Displacement variable Displacement scaling factor
Labeling Attributes	Node, element, and part label visibility

Part Operations

Parts can be copied to show, for example, the same part colored by a different variable. Model parts can be split along an arbitrary plane or any quadric surface, and merged with other model parts. The geometry of parts can be simplified by creating a new part by extracting a simpler representation of an existing part.

Part Representation

Parts can be represented with simpler geometry, both to enhance visualization performance and for special effects. Representation modes include:

Full mode, which represents all the part's elements in the graphics window.

Border mode, which represents 3D elements with their 2D external faces.

Feature angle mode, which represents with 1D elements the "significant" edges of the part (you control what is "significant")

(see Section 3.3, Part Editing, and Section 8.4, Part Mode)

Data Types

EnSight supports a number of common data formats as well as interfaces to various simulation packages. There are four different means to get your data into EnSight.

Type 1 - Direct (built-in) Readers - Are accessed by choosing the desired format in the Data Reader dialog. These include common data formats as well as a number of readers for commercial software.

Type 2 - User-Defined readers - A library of routines is provided with EnSight to allow users to create their own custom interfaces. Like Type 1, User-Defined Readers have the advantage of not requiring a separate data translation step and thus reduce user effort and disk storage requirements. A number of User-Defined Readers are provided with EnSight; complete documentation and dummy routines may be found in the directory $CEI_HOME/ensight74/user_defined_src/readers.

Type 3 - Stand - Alone Translators - May be written by the user to convert data into EnSight format files. A complete description of EnSight formats may be found in Chapter 2 of the EnSight Online User Manual. Several translators are provided with EnSight. These are found in the directory $CEI_HOME/ensight74/translators. Translators must first be compiled before they may be used. Some require links to libraries provided by the vendor of the program in question. See the README files found in each translator's directory.

Type 4 - EnSight Format - A growing number of software suppliers support the EnSight format directly, i.e. an option is provided in their products to output data in the EnSight format.

The table that follows summarizes all of the data formats and software packages for which an interface of Type 1-4 exists. As this information changes frequently, please consult your EnSight support representative should you have any questions. If your format or program is not listed here, there is the possibility that an interface does indeed exist. Contact EnSight support for assistance. Should you create a User-Defined Reader or Stand - Alone Translator and wish to allow its distribution with EnSight, please send an email to this effect to support@ensight.com.

Data Format / Program	Type	Comments
ABAQUS	1	Direct reader for binary or ascii (.fil) files (ABAQUS STANDARD or EXPLICIT
ACUSOLVE	2	Contact vendor for information
ADAGIO	2	Use Exodus II reader
ADINA	3	Use I-DEAS neutral files and translators
ALEGRA	2	Use Exodus II reader
ANSYS	1	Direct reader for binary .rst, .rth, .rmq, .rfl files
CASE (EnSight6/EnSight Gold)	1	Native EnSight formats, EnSight6 Case and EnSight Gold Case
CFD++	4	Exports EnSight Case format
CFD-ACE	2	Contact vendor for DTF reader
CFD-FASTRAN	2	Contact vendor for DTF reader
CFDESIGN	2	Uses Tecplot files and reader
CFF	2	User reader for Common File Format from BOEING
CFX4	2	User reader
CFX5	4	Code exports EnSight Case format
CFX-TASCflow	3	Converts TASCflow output to EnSight format (or use PLOT3D converter from vendor)
CGNS	3	User reader
COBALT	2, 4	User reader (obtain from vendor) - or - Exports EnSight Case Gold format
CRAFT	4	Exports EnSight Case Gold format
CRUNCH	4	Exports EnSight Case Gold format
CTH	2	Use Exodus II reader
ECLIPSE	2	Use RESCUE reader
ENSIGHT (EnSight 5)	1	Original EnSight format (unstructured)
ESTET	1	Direct reader
EXODUS II	2	User reader

Data Format / Program	Type	Comments
FAST Unstructured	1	Direct reader for NASA FAST unstructured format
FEFLO	3	Contact vendor for information
FEMWATER	2	Use GMS reader
FENSAP	4	Contact vendor for information
FIDAP	1	Direct reader for FIDAP neutral (FDNEUT) files
FINE/Aero	1, 2	Use PLOT3D or CGNS files/reader
FINE/Turbo	1, 2	Use PLOT3D or CGNS files/reader
FIRE	4	Code exports EnSight format
FLOW-3D	2	User reader for FLOW-3D results (flsgrf) files
FLUENT (particle files)	3	Converts Fluent particle file to EnSight format
FLUENT	4	Code exports EnSight Casefile format
GASP	4	Exports EnSight Case format
GMS	2	User reader for GMS groundwater modeling framework, contact CEI for information
GUST	4	Exports EnSight Case format
HDF	2	Contact CEI for information
I-DEAS	3	Translator for I-DEAS FEA neutral file
IO/API	2	User reader for MODELS 3 framework, contact CEI for information
KIVA	2, 3	Conversion routines to export EnSight format, contact CEI for info
LS-DYNA	2	User reader for d3plot files
MAYA ESC	4	Contact vendor for information
MODELS 3	2	Use IO/API reader
MOVIE.BYU	1	Direct reader for MOVIE.BYU format files
MPGS 4.1	1	Direct reader for MPGS, EnSight's predecessor
MSC.DYTRAN	2	User reader for MSC/Dytran archive (.arc) or data (.dat) files
MSC.NASTRAN	2	User reader for binary OP2 files
N3S	1	Direct reader for the EDF code N3S
NSU2D / NSU3D	4	Contact CEI for information
PATRAN	3	Converts PATRAN neutral files to MOVIE.BYU format
PHOENICS	1	Use PLOT3D file/reader, contact CEI for user reader
PLOT3D	1	Direct reader for PLOT3D and FAST structured formats
POLY-3D	3	Contact vendor for information
POLYFLOW	1	Read as FIDAP neutral file, FDNEUT
POWERFLOW	3	Contact vendor for information
PRESTO	2	Use Exodus II reader
PRONTO	2	Use Exodus II reader
PXI	2	User reader for Parallel Exodus Interface format
RAD THERM	4	Contact vendor for information
RESCUE	2	User reader for Schlumberger reservoir modeling framework, contact CEI for information
SCRYU	2	Contact vendor for information
SILO	2, 3	Reads various formats supported by SILO API
SPHINX	4	Code exports EnSight format
STAR-CD (Version 3.0.5 & up)	4	Code exports EnSight Casefile format (including particle data)
STL	2	User reader for STL geometry files (may also be exported)
TECPLOT	2	User reader for TECPLOT structured and unstructured formats
USM3D	4	Contact CEI for information
VECTIS	2, 3	User reader

Geometry EnSight reads unstructured geometric data grouped by parts. Data can be 2D or 3D.

Analysis Results EnSight reads scalar and vector variable values associated with each node of the geometry. The loading of variable values is optional, and variables can be

unloaded to free memory.

Measured Data

EnSight can read measured or computed particles (referred to as discrete particles in EnSight). Particles can have the same variables as the model geometry, or their own variables. Particles can be displayed as points, crosses, or spheres whose size can vary according to a variable value. Sphere smoothness is also controllable. Discrete particles can be time dependent with the geometry, or time dependent with a steady geometry.

(See EnSight Gold Measured/Particle File Format, in Section 11.1)

Cases

EnSight provides the capability to read and manipulate up to eight datasets or models at a time. Each new "Case" is handled by its own Server process while the Client appropriately deals with merged variables, solution times, etc. This option allows both the recombination of models partitioned for parallel analysis and a number of comparative operations.

Graphical Environment

Parts are visualized in a main Graphics Window. You can create additional viewports and adjust their size to your needs. Each viewport has its own transformations (global, local, look-at, look-from, and Z-clip locations). Part visibility is also controllable in each viewport.

A separate "Show Selected Part(s)" window helps in identifying parts.

Hidden Lines and Shaded Surfaces

You can choose to shade surfaces and/or hide hidden lines for realistic views of your model. Visible element edges can be overlaid on shaded solid images.

Clipping

In addition to user-control of the front and back clipping planes of your workspace, you can cutaway parts or portions of parts along any plane using Auxiliary Clipping. Individual parts can be made immune to the effect, enabling you to look at parts inside of other parts.

Annotations

EnSight can display text-strings, lines, arrows, logos, entity labels, and color-map legends. Text annotations (which may include variables) can be made to automatically update for time-dependent data.

Image Output

Screen images can be saved from within EnSight. Conversion to popular formats is under user control as the image is saved.

Perspective

You have your choice of a perspective view or an orthogonal view. The latter is useful for comparing the position of parts and positioning EnSight tools.

Background Color

You can specify a constant or blended color background for the main Graphics Window and independently for any Viewports displayed in the Graphics Window.

Transformations

The standard transformations of rotate, translate, and scale are available, as well as positioning of the Look-At and Look-From points. An automatic zoom control is available. The transformation-state (the specific view in the Graphics Window and Viewports) can be saved for later recall and use. Transformations can be performed with precision in a dialog, or interactively with the mouse. For the latter case, you can choose to represent the parts with bounding-boxes all the time or only while they are moving. Transformations can individually be reset by type.

(see Chapter 9, Transformation Control)

Frames

Transformations actually apply to frames—the parts attached to the frames transform right along with their frame. You can create new frames and transform them like parts (in a dialog or with the mouse), and change to which frame a part is attached. You control whether and how frames are displayed, enabling you to use them as rulers. Frames can have rectangular, cylindrical, or spherical coordinates.

Frames, and therefore all parts attached to them, can be “periodic”. Rotational or translational periodicity (as well as mirror symmetry) attributes are under user control allowing, for example, an entire pie to be built from one slice of the pie.

(see Section 8.6, Frame Mode and Section 9.2, Frame Transform)

Coloration

Parts can be colored according to the value of a variable. This “fringes” feature works for both lines and surfaces. The coloration of each part is an attribute of that part.

Variable Palettes

You control the value-color correspondence with a *palette*. A palette’s scale can be linear, logarithmic, or exponential. Palettes can have a continuous range of colors, or color bands. Off-the-scale parts or portions of parts can be made invisible.

(see Section 4.2, Variable Summary & Palette)

Created Parts

In addition to the *model parts* defined in the dataset, you can (and usually will) define additional *created parts* based on both the geometry *and* variable-values of existing *parent-parts.* Model parts and most kinds of created parts can be used as parent parts. Created parts have their own part attributes, including the *creation attributes* that define them, but *remain dependent upon their parent-parts.* A created part *automatically regenerates* if any of its parent-parts are changed in a way that will affect its representation.

Clips

A clip is a plane, line, box, quadric surface (cylinder, sphere, cone, etc.), or revolution surface passing through specified parent-parts. The plane clip can either be limited to a specific area (finite), or clip infinitely through the model. A line clip is finite and other clips are infinite in nature. You control the location of the various clips with an interactive Tool or appropriate parameter or coefficient input.

A clip line has query points along the line (you control how many).

A clip plane will either be a true clip through the model, or can be made to be a grid where the grid density is under your control.

Clip surfaces can be animated as well as manipulated interactively.

In most cases you will create a clip which is the intersection of the clip tool and the parent parts. This clip can either be a true intersection or all elements that cross the intersection surface (a “crinkly” surface). You can also choose to cut the parent parts into half spaces.

(see Section 7.5, Clip Create/Update)

Contours

Contours are created by specifying which parts are to be contoured, and which function palette to be used to specify the contour-level values.

(see Section 7.2, Contour Create/Update)

Developed Surfaces

Developed Surfaces can be created from cylindrical, spherical, conical, or revolution clip surfaces. You control the seam location and projection method that will flatten the surface.

(see Section 7.9, Developed Surface Create/Update)

Elevated Surfaces

Elevated Surfaces can be displayed using a scalar variable to elevate the displayed surface of specified parts. The elevated surface can have side walls.

(see Section 7.7, Elevated Surface Create/Update)

Isosurfaces

Isosurfaces can be created using a scalar, vector component, vector magnitude, or coordinate. Isosurfaces can be manipulated interactively or animated by incrementing the isovalue.

(see Section 7.3, Isosurface Create/Update)

Particle Traces

Particle traces—both streamlines (steady state) and pathlines (transient)—trace the path of either a massless or massed particle in a vector field. You control which parts the particle trace will be computed through, the duration of the trace, which vector variable to use during the integration, and the integration time-step limits. Like other parts, the resulting particle trace part has nodes at which *all* of the variables are known, and thus it can be colored by a different variable than the one used to create it. Components of the vector field can be eliminated by the user to force the trace to, for example, lie in a plane. The particle trace can either be displayed as a line, or a ribbon or square tube showing the rotational components of the flow field. Streamlines can be computed upstream, downstream, or both.

Particle traces originate from *emitters*, which you create. An emitter can be a point, rake, net, or can be the nodes of a part. Each emitter has a particle trace emit time specified which you set, and a re-emit time (if the data case is transient) can also be specified. Point, rake, and net emitters can be interactively positioned with the mouse. For streamlines, the particle trace continues to update as the emitter tool is positioned interactively by the user.

(see Section 7.4, Particle Trace Create/Update)

Profiles

Profile plots can be created by scalar, vector component, or vector magnitude. You control the orientation of the resulting profile plot.

(see Section 7.8, Profile Create/Update)

Subsets

A subset Part can contain node and element ranges of any model Part.

(see Section 7.16, Subset Parts Create/Update)

Vector Arrows

Vector arrows show the direction and magnitude of a vector field. Vector arrows originate from element vertices, element nodes (including mid-side nodes), or from element centers. You specify which parts are to have arrows and which vector variable to use for the arrows, as well as a scale factor. You can eliminate components of the vector, and can also filter the arrows to eliminate high, low, low/high, or banded vector arrow magnitudes. The vector arrows can be either straight, or curved and can have arrow heads. The arrow heads are either proportional to the arrow or can be of fixed size.

(see Section 7.6, Vector Arrow Create/Update)

Tensor Glyphs

Tensor glyphs show the direction of the principal eigenvectors. You specify which eigenvectors you wish to view and how you wish to view compression and

tension.

(see Section 7.17, Tensor Glyph Parts Create/Update)

Vortex Cores

Vortex cores show the center of swirling flow in a flow field.

(see Section 7.18, Vortex Core Create/Update)

Shock Surfaces/ Regions

Shock surfaces or regions show the location and extent of shock waves in a 3Dflow field.

(see Section 7.19, Shock Surface/Region Create/Update)

Separation/ Attachment Lines

Separation and attachment lines show where flow abruptly leaves or returns to the 2D surface in 3D fields.

(see Section 7.20, Separation/Attachment Lines Create/Update)

Queries

In addition to visualizing information, you can make numerical queries.

You can query on information for a node, point, element, or a part.

You can query on information for a data set (such as size, no. of elements, etc.)

You can query scalar and vector information for a point or node over time.

You can query scalar and vector information along a line. The line can either be a defined line in space, or a logical line composed of multiple 1D elements for a part (for example query of a variable on a particle trace).

You can query to find the spatial or temporal mean as well as the min/max information for a variable.

Where applicable, query information can be in the form of a Fast Fourier Transform (FFT).

Plotting

The plotter plots X vs. Y curves. The user controls line style, axis control, line thickness and color. All query operations that result in multiple value output in EnSight can be sent to the plotter for display. The user can control which curves to plot. Multiple curve plots are possible. All plotable query information can be saved to a disk file for use with more sophisticated plotting packages.

(see Section 7.11, Query/Plot and Section 7.12, Interactive Probe Query)

Variable Creation

New information can be computed resulting in a constant, a scalar, or a vector. EnSight includes useful built-in functions for computing new variables:

Area	Case Map
Coefficient	Complex from real and imaginary
Complex Argument	Complex Conjugate
Complex Imaginary	Complex Modulus
Complex Transient Response	Complex Real
Curl	Density
Density, Normalized	Density, Stagnation
Density, Normalized Stagnation	Density, Log of Normalized
Divergence	Element to Node
Energy, Total	Energy, Kinetic
Enthalpy	Enthalpy, Normalized

Enthalpy, Stagnation
Enthalpy, Normalized Stagnation
Entropy
Flow
Flow Rate
Fluid Shear Stress
Fluid Shear Stress Max
Force
Force1D
Gradient
Gradient Approximation
Gradient Tensor
Gradient Tensor Approximation
Helicity Density
Helicity, Relative
Helicity, Relative Filtered
Integral, Line
Integral, Surface
Integral, Volume
Length
Mach Number
MakeScalElem
MakeScalNode
Make Vector
Mass Flux Average
Max
Min
Moment
Moment Vector
Momentum
Node to Element
Normal
Normal Constraints
Normalize Vector
Offset Variable
Pressure
Pressure Coefficient
Pressure, Dynamic
Pressure, Normalized
Pressure, Log of Normalized
Pressure, Pitot
Pressure, Pitot Ratio
Pressure, Stagnation
Pressure, Normalized Stagnation
Pressure, Stagnation Coefficient
Pressure, Total
Rectangular to Cylindrical Vector
Shock Plot3d
Spatial Mean
Speed
Sonic Speed
Stream Function
Swirl
Temperature
Temperature, Normalized
Temperature, Stagnation
Temperature, Normalized Stagnation
Temperature, Log of Normalized
Temporal Mean
Tensor Component
Tensor Determinate
Tensor Eigenvalue
Tensor Eigenvector
Tensor Make
Tensor Tresca
Tensor Von Mises
Velocity
Volume
Vorticity

A calculator and built-in math functions also are useful for creating variables. Any created variable is available throughout EnSight, and is automatically recomputed if the user changes the current time (in case of transient data).

(see Section 4.3, Variable Creation)

In addition to the built-in general functions and the calculator options, variables can be derived from user written external functions called User Defined Math Functions (UDMF). The UDMF's appear in EnSight's calculator in the general function list and can be used just as any calculator function.

Another feature of EnSight facilitates the creation of boundary layer variables.

(see Section 7.21, Boundary Layer Variables Create/Update)

Transient Data

EnSight handles transient (time dependent) data, including changing connectivity for the geometry. You can easily change between time steps via the user interface. All parts that are created are updated to reflect the current display time (you can override this feature for individual parts). You can change to a defined time step, or change to a time between two defined steps (EnSight will linearly interpolate between steps), though the “continuous” option is only available for cases without transient geometry.

Animation

You can animate your model in three ways: particle trace animation, flipbook animation, and keyframe animation.

Particle Trace Animation

Particle trace animation sends “tracers” down already created particle traces. You control the color, line type, speed and length of the animated traces.

If transient data is being animated at the same time, animated traces will automatically synchronize to the transient data time, unless you specifically indicate otherwise.

Flipbook Animation

Flipbook animation is simpler to do than keyframe animation, while allowing three common types of animation:

Sequential presentation of transient data
Mode shapes based on a displacement variable
EnSight created parts with an animation delta that recreates the part at a new location (i.e., moving isosurfaces and Clip surfaces).

You can specify the display speed, and can step page-by-page through the animation in either direction. You can load some, or all the desired data. If you later load more data, you can choose to keep the already loaded data. With transient data, you can create pages between defined time steps, with EnSight linearly interpolating the data.

Flipbooks can be created in two formats: a) Object animation where new objects are created for each time step. The user can then manipulate the model during animation play back or b) Image animation where a bitmap of the Main View image is created and stored off for each animation page.

(see Section 7.14, Flipbook Animation)

Keyframe Animation

Keyframe animation performs linearly interpolated transformations between specified key frames to create animation frames. Command language can be executed at key frames to script your animation. Some minimal editing is possible by deleting back to defined key frames. Animation key frames can be saved and restored from disk. Animation can be done on transient data and can automatically synchronize with simultaneous flipbook animation and particle trace animation.

Keyframe animation can be recorded to disk files using a format of your choice.

(see Section 7.15, Keyframe Animation)

Implementation

Interface

EnSight uses the OSF/Motif graphical user interface conventions for the Unix version and Win32 conventions under the Windows xx operating system. Many aspects of the interface can be customized.

Client-Server

EnSight is a *distributed application*—it runs as separate processes that

communicate with each other via a TCP/IP or similar connection. The *Server* performs most CPU-intensive and data-handling functions, while the *Client* performs the graphics-display and user-interface functions. The Client and Server can run together on one host workstation in a “stand-alone” installation or on two host systems with each hardware system performing the functions it does best. When more than one case is loaded the Client communicates with multiple Server processes.

A special server-of-servers (SOS) can be used in place of a normal server if you have partitioned data. This SOS acts like a normal server to the client, but starts and deals with multiple servers, each of which handle their portion of the dataset. This provides significant parallel advantage for large datasets.

(see Section 11.8, Server-of-Server Casefile Format)

Command Language

Each action performed with the graphical user interface has a corresponding EnSight command. A session file is always being saved to aid in recovery from a mistake or a program crash. The command language is human-readable and can easily be modified. Command files can be played all the way through, or you can choose to stop the file and step through it line-by-line.

Context Files

You can define a “context” and apply it to similar datasets.

Graphics Hardware

Many graphics functions of EnSight are performed by your workstation’s graphics hardware. EnSight version 7 uses the OpenGL graphic libraries and is available on a multitude of hardware platforms.

Solid image lighting can be done either in hardware, or in software. The software option does not recalculate the lighting changes due to transformations (hence, the light source seems to move with the model). While this is less realistic, it can greatly increase performance and decrease memory requirements.

Parallel Computation

EnSight supports shared-memory parallel computation via POSIX threads on a variety of platforms. As of this writing, threads are supported on IRIX 6.5, HP-UX 11.0, OSF1 V4.0, AIX 4.3, Solaris 8, Linux 2.2, and Linux 2.4 operating systems. Additional support may be added in the near future. Threads are used to accelerate the computation of streamlines, clips, isosurfaces, and other compute-intensive operations. (See How To Setup for Parallel Computation for details on using.)

Macros

You can define macros tied to mouse buttons or keyboard keys to automate actions you frequently perform.

Saving and Archiving

You can save the entire current status of EnSight for later use, and can save other entities as well (including the geometry of created parts for use by your analysis software).

(see Section 2.5, Archive Files)

Documentation

The printed EnSight documentation consists of the Getting Started manual.

The on-line EnSight documentation consists of the EnSight User Manual, a Command Language Reference Manual, a How To Manual and the Getting Started Manual.

User Manual

The EnSight User Manual is organized as follows:

User Manual Table of Contents

Chapter 1 - Overview

Chapter 2 - Input/Output. This chapter describes the reading of model data (with internal or user-defined readers), command files, archive files, context files, scenario files, and various other input and output operations.

Chapter 3 - Parts. This chapter describes the various types of Parts, selection, identification, and editing of Parts, and various Part operations,

Chapter 4 - Variables. This chapter describes the selection and activation of variables, color palettes, and the creation of new variables.

Chapter 5 - GUI Overview. This chapter describes the EnSight Graphic User Interface.

Chapter 6 - Main Menu. This chapter describes the features and functions available through the buttons and pull-down sub menus of the Main Menu of the GUI.

Chapter 7 - Features. This chapter describes the features and functions available through the Icon buttons of the Feature Icon Bar of the GUI.

Chapter 8 - Modes. This chapter describes the features and functions available through the Icon Buttons of the Mode Icon Bar in the six different Modes.

Chapter 9 - Transformation Control. This chapter describes the Global transformation of all Frames and Parts, the transformation of selected Frames and Parts as well as selected Frames alone, the transformation of the various Tools, and the adjustment of the Z-Clip planes and the Look At and Look From Points.

Chapter 10 - Preference File Formats. This chapter describes the format of various preference files which the uses can affect.

Chapter 11 - EnSight Data Formats. This chapter describes in detail the format of the various EnSight data formats.

Chapter 12 - Utility Programs. This chapter describes a number of unsupported utility programs distributed with EnSight.

User Manual Index

Cross References in the User Manual will appear similar to:

(see Chapter __ or (see Section __

Clicking on these Cross References will automatically take you to the referenced Chapter or Section.

Command Language Reference Manual

This manual describes each command of EnSight's command language.

How To...

The various How To documents available on-line provide detailed instructions which explain how to perform various operations within EnSight such as creating an isosurface or reading in data.

Ordering To order copies of EnSight documentation, contact CEI by telephone at the numbers listed below or via the internet:

Email: ensight_mkt@ceintl.com

Newsletter CEI periodically publishes an EnSight newsletter, called the EnSight Post. If you would like to receive the newsletter, send Email to:

Email: post_editor@ceintl.com.

Contacting CEI

EnSight was created to make your work easier and more productive. If you have any questions about or problems using EnSight, or have suggestions for improvements, please contact CEI support:

Phone: (800) 551-4448 (USA)
(919) 363-0883 (Outside-USA)
Fax: (919) 363-0833

Email: support@ensight.com